

Utility Application

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Titled:

GANGABLE ELECTRICAL BOX

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GANGABLE ELECTRICAL BOX

Field of the Invention

The present invention relates generally to electrical boxes for installing switches, plugs and accessories within a wall such that they are accessible from outside the wall, and more particularly to laterally ganging such electrical boxes to a stud within the wall.

Background

It is common to make electrical boxes in differing widths to accommodate varying numbers of electrical components, such as electrical outlets, switches, etc that are installed in the electrical boxes. This multiplicity of sizes creates manufacturing and inventory problems for the fabricators, distributors, retailers and buildings. Gangable electrical boxes have been created to couple a plurality of standard electrical boxes together to accommodate a growing number of electrical components that must be placed adjacent to each other in the wall of a residence or commercial building.

Electrical boxes are typically secured to a wall stud by means of a nail or screw. Present electrical boxes have a nail attachment device so that the box can be mounted to the side face of the wall stud or a screw attachment device so that a box can be mounted to the front face of the stud, but such boxes do not enable both types of installations.

What has also been described in existing gangable electrical boxes is an electrical box with a frangible side wall that can be removed when an adjacent electrical box is ganged to the electrical box thereby providing for lateral access between the interiors of the ganged boxes. A drawback to such an electrical box is that the entire side wall is removed thereby leaving the ganged boxes without extra structural support for rigidity and to resist stresses caused when the

electrical components are installed. Such designs also do not leave a bounding edge around the area where the inner wall is removed for structural support.

In addition, present electrical boxes are not truly hermaphroditic to provide for ease of installation and insertion and removal of side walls, such as that shown and described in US Patent No. 5,574,255 and US Patent No. 5,574,255 C1, each entitled “Laterally Expandable Modular Electrical Box.” This type of design requires a number of differing parts and increases complexity for the purchaser and installer of the gangable electrical box. The contractors must order a multitude of differently sized electrical boxes to be able to select the required size as needed. Likewise, fabricators, distributors and retailers must be able to supply all of the sizes that may be required in any particular construction project. This results in complexity in the part ordering and installation process, while requiring manufacturers to track and produce a number of parts and the associated catalogue numbers or SKUs.

Accordingly, it is desirable to have a single electrical box configuration that is easily gangable, hermaphroditic, which maintains full structural integrity when a frangible portion of a separating wall is removed, which has added rigidity and robustness, and has a minimum of SKUs.

Summary of the Invention

The present invention eliminates the above difficulties and disadvantages by providing an electrical box that is easily adaptable for ganging to an adjacent electrical box. Only two part identifiers or SKUs have to be ordered by the purchaser of the present electrical box: a body member and a hermaphroditic side wall that is doubled to provide the two side walls for the box. In particular, the electrical box includes a body member having a pair of opposed side walls, a rear wall contiguously formed between the pair of opposed side walls, a pair of opposed guides bounding the body member and integrally formed therewith, which are orthogonal to the side walls for added rigidity, and a pair of opposed tabs disposed between the pair of opposed side walls and integrally formed on the pair of opposed guides. A nail guide is formed on each of the body member's side walls for nailing the electrical box to a side face of the wall stud.

First and second hermaphroditic side walls are provided in the electrical box and each include a detachably coupled portion for permitting lateral access between the electrical box and the adjacent electrical box when the detachably coupled portion is removed and the electrical box is ganged to the adjacent electrical box. The detachably coupled portions are disposed longitudinally away from the rear wall of the body member and defined by a bounding edge so that rigidity is maintained and twisting of the electrical box prevented when the detachably coupled portions are removed from the first and second side walls. A pair of opposed retention members are disposed on the side wall such that each have inner and outer adjacent longitudinal slots for slidably receiving one of the pair of opposed guides within one of the adjacent longitudinal slots when the side wall is inserted into the body member of the electrical box and the adjacent electrical box. A pair of opposed flanges are integrally formed with the pair of opposed retention members and have an aperture disposed therein for insertion of a screw or nail

so that the electrical box can be secured to a front face of the wall stud. A pair of opposed stop members are integrally formed with the pair of opposed retention members for adding rigidity to the side wall when inserted into the body member and for abutting one of the pair of opposed guides of the body member and prevent stressing of the body member when the detachably coupled portions are removed. The pair of opposed stop members further prevent longitudinal movement of the first and second side walls toward the rear wall of the body member when the first and second side walls are inserted into the body member and resist stressing of the body member when the detachably coupled portions are removed. In addition, a pair of laterally spaced brackets are disposed on at least one side of the side wall for abutting one of the opposed guides of the body member and for adding rigidity to the side wall when inserted into the body member and when the detachably coupled portions are removed. A coupling aperture is also disposed in the side wall for receiving one of the body member's pair of opposed tabs therein when the side wall is inserted into the body member such that the side wall is releasably secured to the body member.

Brief Description of the Drawings

FIG. 1 is an exploded perspective view of an electrical box of the present invention.

FIG. 2 is a bottom plan view of a first and second side wall of the electrical box of the present invention.

FIG. 3 is a bottom plan view of the electrical box of the present invention.

FIG. 4 is a perspective view of the electrical box of the present invention secured to a side face of a wall stud.

FIG. 5 is a perspective view of the electrical box of the present invention secured to a front face of a wall stud.

FIG. 6 is a partially exploded view of the electrical box of the present invention ganged to an adjacent electrical box.

FIG. 7 is a partially exploded view of the electrical box of the present invention ganged to the adjacent electrical box.

FIG. 8 is a bottom plan view of the electrical box of the present invention ganged to the adjacent electrical box.

FIG. 9 is a detailed view of a retention member along detail A-A of FIG. 8 having a guide from the electrical box disposed in an inner slot and a guide from the adjacent electrical box disposed in an outer slot.

Detailed Description of the Preferred Embodiment(s)

The summarized features, aspects, and advantages of the present invention will now be discussed in the following detailed description and appended claims, which are to be considered in conjunction with the accompanying drawings in which identical reference characters designate like elements throughout the views.

Shown in FIG. 1 is an electrical box 10 for receiving a first set of wires therein and that is adaptable for securing to an adjacent electrical box 50, as shown in FIGS. 6-8, and that will be discussed in greater detail below. The electrical box 10 and adjacent electrical box 50 are preferably constructed of nylon, but could be constructed of any thermo-plastic that is relatively hard and durable. The construction could also be of metal such as galvanized metal.

The electrical box 10 requires only two part identifiers or SKUs that have to be ordered by the purchaser: a body member 12 and a preferably hermaphroditic first and second side walls, 14, 16 that are identical. Therefore, one SKU is needed for the body member 12 and a second is needed for the identical side walls 14, 16.

Referring again to FIG. 1, the electrical box 10 includes a generally C-shaped body member 12 that has a pair of opposed side walls 42 and a rear wall 52 contiguously formed between the pair of opposed side walls 42. A pair of opposed guides 40 bound the opposing side walls 42 and rear wall 52 of the body member 12, wherein an edge 36 is created, and are integrally formed therewith. The opposed guides 40 are formed orthogonal to the side walls 42 for added rigidity and for coupling the body member 12 to the first and second side walls 14, 16, via retention members 20, as will be discussed in greater detail below. A pair of opposed tabs 38, which are best shown in FIG. 3, are disposed between the pair of opposed side walls 42 and each integrally formed on the pair of opposed guides 40 at the edge 36 that bounds the rear wall 52. A nail guide 34 is formed on each of the opposing side walls 42 for nailing the electrical box 10 to a side face 64 of a wall stud 46 as shown in FIG. 4.

As is further shown in FIG. 1, first and second side walls 14, 16 are provided in the electrical box 10 and are preferably identical and hermaphroditic. Each of the first and second side walls 14, 16 include a detachably coupled portion 18, which is preferably U-shaped. The detachably coupled portions 18 are disposed longitudinally separate from the rear wall 52 of the body member 12, as shown in FIGS. 4-7. When the electrical box 10 and the adjacent electrical box 52 are ganged as shown in FIGS. 6 and 7, the second side wall 16, of the electrical box 10 is mounted to the side face 64 of the wall stud 46 or the first side wall 14 if the electrical box 10 is mounted to the front face 62 of the wall stud 46. The detachably coupled portions 18 may be left intact when the electrical box 10 and the adjacent electrical box 50 are ganged to physically and electrically separate a high voltage component such as an electrical plug from a low voltage component such as a telephone jack. Alternatively, one of the detachably coupled portions 18

may be removed for permitting lateral access between the electrical box 10 and the adjacent electrical box 50.

A further advantage in the present invention is a bounding edge 58 that is formed around and defines the detachably coupled portions 18. When one or both of the detachably coupled portions 18 are removed, the bounding edge 58 of the first and second side walls 14, 16 remains installed in the body member 12 so that rigidity is maintained and stresses on the electrical box are greatly attenuated. In addition, the bounding edges 58 of each of the first and second side walls 14, 16 each abut one of the opposing guides 40 such that a double edge thickness is created between the side walls 14, 16 and the body member 12 for added rigidity and robustness of the electrical box 10.

In addition and as shown in FIGS. 1, 2 and 7, a pair of laterally spaced brackets 28 are disposed on at least one side of the side walls 14, 16, but preferably on both the side walls 14, 16, for seating on edge 36 of the opposed guides 40 adjacent to the rear wall 52 of the body member 12. The pair of laterally spaced brackets 28 are preferably L-shaped and when they are seated on the abutment edge 36 of the opposed guides 40, the brackets 28 add rigidity to the particular first or second side walls 14, 16 when inserted into the body member 12. The pair of laterally spaced brackets 28 also prevent side-to-side bending of the first and second side walls 14, 16 and twisting of the first and second side walls 14, 16, which is especially applicable when the detachably coupled portions 18 are being separated from the bounding edge 58 of the side walls 14, 16.

As mentioned previously, a pair of opposed tabs 38 are integrally formed on the bounding edge 36. On each of the first and second side walls 14, 16 a coupling aperture 32, which is preferably rectangular as shown in FIGS. 1, 4-7, is also disposed for receiving one of the pair of

opposed tabs 38 therein when one of the first or second side walls 14, 16 is inserted into the body member 12 such that the first or second side walls 14, 16 is releasably secured to the body member 12. Once secured in the coupling apertures 32, as shown in FIG. 3, an installer can use a tool such as a flat head screwdriver to press the tab 38 inward toward the body member 12 to release the particular side wall 14, 16 from the body member 12.

A pair of opposed retention members 20 are disposed on the first and second side walls 14, 16. As shown in FIGS. 1 and 9, each has inner and outer adjacent longitudinal slots 22 for slidably receiving one of the pair of opposed guides 40 within one of the adjacent longitudinal slots 22, and preferably the inner slot 22, when the first side wall 14 or the second side wall 16 is inserted into the body member 12 of the electrical box 10. Detail A-A of FIG. 8 is shown in FIG. 9 such that when the adjacent electrical box 50 is ganged to the electrical box 10, an opposed guide 40 from the electrical box 10 is disposed in the inner slot 22 of the opposing retention members 20 and a guide 40 from the adjacent and identical electrical box 50 is disposed in the outer slot 22 of the opposing retention members 20. Therefore, two identical body members 12 are coupled together by one retention member 20, thereby ganging the first electrical box 10 to the adjacent box 50.

A first and a second pair of opposed flanges 24 are integrally formed with the pair of opposed retention members 20 on each of the first and second side walls 14, 16 and preferably each have an aperture 26 disposed therein for insertion of a screw or nail. As mentioned above, nail guides 34 are formed on each of the opposing side walls 42 for nailing the electrical box 10 to the side face 64 of the wall stud 46 as shown in FIG. 4. Thus, the electrical box 10 is secured to the front face 62 of the wall stud 46 via the first pair of opposed flanges 24 when the first side wall 14 abuts the side face 64 of the wall stud 46 and is secured to the side face 64 of the wall

stud 46 via at least one of the pair of opposed nail guides 34 when the second side wall 16 abuts the side face 64 of the wall stud 46. A simple rotation of the electrical box 10 will facilitate either securement option for the installer.

A pair of opposed stop members 30 are integrally formed with the pair of opposed retention members 20 on each of the first and second side walls 14, 16 for adding rigidity thereto when inserted into the body member 12. The opposed stop members 30 also reduce stresses placed on the electrical box 10. Moreover, the pair of opposed stop members 30 abut one of the pair of opposed guides 40 of the body member 12 thereby preventing longitudinal movement of the first and second side walls 14, 16 toward the rear wall 52 of the body member 12 when the first and second side walls 14, 16 are inserted into the body member 12. Furthermore, the pair of opposed stop members 30 form a ninety-degree angle and prevent twisting of the opposing guides 40 and thus the body member 12 when disposed in the inner and outer slots 22 of the retention members 20.

Although the invention has been described in detail above, it is expressly understood that it will be apparent to persons skilled in the relevant art that the invention may be modified without departing from the spirit of the invention. Various changes of form, design, or arrangement may be made to the invention without departing from the spirit and scope of the invention. Therefore, the above description is to be considered exemplary, rather than limiting, and the true scope of the invention is that defined in the following claims.